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ABSTRACT

Tech prep partnerships facilitate innovative college teaching in the areas of curriculum content and instructional strategies through the collaborative efforts of secondary, postsecondary, academic, and technical faculty and business and industry representatives. Tech prep provides curricula and instruction that blend secondary and postsecondary education to increase students' success and develop skills in conjunction with the employment requirements of the business sector. As an innovative approach to education, tech prep also encourages innovative and collaborative instructional strategies and curricular coordination. Currently, for example, over 35 programs in the Santa Fe Community College (SFCC)-Alachua Tech Prep Consortium, in Florida, provide seamless coordination between high school and college curricula. Tech prep courses also feature a strong core of academic courses in communication, science, mathematics, and computer technology integrated with sequential technical courses. The 1991 Secretary's Commission on Achieving Necessary Skills (SCANS) study of necessary business skills found that more than half of the nation's youth left school without the foundation to hold good jobs. Active partnerships, such as the SFCC-Alachua Consortium, South Carolina's Partnership for Academic and Career Education, or the Seattle Tech Prep Consortium, in Washington, can provide students with these skills. Educators need extensive development and planning time with colleagues in other disciplines and the business sector, however, to effectively integrate and update curricula. The SCANS competencies are appended. Contains 13 references. (BCY)

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INCREASING TEACHER EFFECTIVENESS THROUGH TECH PREP PARTNERSHIPS

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Abstract

Tech Prep partnerships facilitate innovative college teaching in the areas of curriculum content and instructional strategies through the collaborative efforts of secondary/postsecondary, academic/technical faculty members and business and industry representatives. Thoroughly ascertaining what academic and technical skills are essential to prepare students for higher education and for careers in a technological society and incorporating the information into new curriculum necessitate exciting and challenging changes in college classrooms. Examples of teaching excellence throughout the nation including Florida, South Carolina, and Washington will be highlighted in this workshop.

Introduction

The Tech Prep consortia in Florida facilitate innovative college teaching through partnerships among instructors; civic, business, and industry representatives; and secondary school teachers in the development of curriculum. Funded by a grant through the Carl Perkins Act of 1990 under the administration of the Florida Department of Education's Division of Vocational, Adult, and Community Education, the Tech Prep consortium of Santa Fe Community College (SFCC) and the School Board of Alachua County (SBAC) in north central Florida began collaborative planning through an extensive network of curriculum development committees established in 1991.

Why Tech Prep?

The skill level of jobs is becoming increasingly complex and fewer and fewer jobs are available at the unskilled level. Many futurists have predicted that eighty per cent (80%) of the jobs by the year 2000 will require some postsecondary education. Currently, in the United States, only seventy-five per cent (75%) of students graduate from high school with their peers and only sixty-three percent (63 %) of those pursue postsecondary education. There is a vast difference between the skill levels acquired by students when leaving formal education and the employee skill level requirements of business and industry .

The future success of the United States will be based on how well its people compete in the world economic environment. Economist Lester Thurow, in his book Head to Head: The Coming Economic Battle Among Japan, Europe, and America, has linked the success of educators in reaching all students, not just the top twenty-five percent (25%), to the economic success of the United States. The current belief that the United States enjoys the highest standard of living is incorrect. If this country is to succeed in this economic world competition, changes must be made to improve the education of all students.

Business Week reported research about the changes between 1985-2000 in the educational requirements for jobs. The chart in **Appendix I** shows that fewer jobs will be available in the decade of the nineties for high school graduates and that there will be a large increase of jobs requiring one-year vocational certificates and two-year Associate of Science degrees. This fact is being recognized in Florida by employers as documented in a recent study by the state Department of Education. **Appendix II** illustrates that Florida graduates of technical programs at community colleges are earning higher entry level wages than graduates of universities.

Tech Prep addresses these challenges through curriculum and instruction that blend secondary and postsecondary education in a manner designed to increase students' success and to develop students' skills in conjunction with the employment requirements of business and industry.

Tech Prep Instructional Strategies

Although many students learn best in a concrete manner, the majority of the instruction at both high school and college levels has focused on the abstract. This problem of teaching material out of context is explored by David Kolb in Experiential Learning: Experience as the Source of Learning and Development. Howard Gardner, in Frames of Mind: The Theory of Multiple Intelligences, states that, while there are seven different intelligencies, traditional instructional methods address only two learning styles. Many students learn best through intelligences other than the two traditional modes of verbal and analytical which were measured by Alfred Binet. Gardner defines the following measures of intelligence: linguistic, logical and mathematical, kinesthetic, intrapersonal, interpersonal, musical, and spatial. Through Tech Prep staff development workshops involving secondary and postsecondary, academic and technical teams of teachers; instructional strategies and materials which utilize multiple intelligences have been explored.

In their article "Five Standards of Authentic Instruction," Gary Wehlage and Fred Newmann documented the following instructional constructs necessary for engaging students in learning: 1. higher-order thinking, 2. depth of knowledge, 3. connectedness to the world beyond the classroom, 4. substantive conversation, and 5. social support for student achievement. Dale Parnell suggests a theory of relevance and rigor in successful teaching that brings reality to the classroom by restructuring instruction and learning in his book Logo Learning: The Search for Meaning in Education.

Tech Prep focuses on bringing positive changes in instruction to assist instructors at both the high school and college level in achieving success with all students. Instructional strategies and activities that are presented in context, that address multiple intelligences, that meet the demands of authentic instruction (Tech Prep refers to connectedness as applied), and that bring reality to the classroom are developed by innovative teams. Changes are being made through collaborative planning groups comprised of high school and college instructors, school administrators, business and industry representatives, students and parents. The outcomes of these partnerships result in successful college teaching for students enrolled in Tech Prep programs.

Curricular Coordination

Through an ongoing review of existing curricula to eliminate duplication and to identify omissions, teams of secondary/ postsecondary educators and business representatives have designed course sequence plans and updated course content in both technical and academic disciplines. Educators in secondary school and college administrative, instructional, and advisement positions have met frequently with business representatives to share syllabi, textbooks, and workplace readiness suggestions. Currently, over thirty-five Tech Prep programs in the SFCC-Alachua consortium provide seamless coordination between high school and college curricula which benefit both students and their prospective employers.

By assessing the skills that students need to become successful citizens and employees, the SFCC-Alachua Tech Prep consortium initiated systemic educational reform with the involvement of over four hundred secondary and college educators, business representatives, and community leaders. The subsequent successful college teaching has been the result of many hours of cooperative efforts to insure more relevant and rigorous classroom experiences throughout a student's educational progression.

The Tech Prep consortium composed of Santa Fe Community College and the Alachua School District conducted a community wide survey to determine what skills were essential to successful employment in a variety of occupational specialties. The following proficiencies were prioritized by employers in Alachua County: 1. ability to apply oral and written communication, 2. interpersonal skills, 3. problem solving, 4. decision making, 5. higher level reasoning, 6. scientific concepts, 7. mathematical concepts, 8. computer technology, and 9. entrepreneurial skills. Curriculum development teams incorporated the applications for these skills in courses for Tech Prep students.

Articulated Academic and Technical Programs of Study

Tech Prep programs feature a strong core of academic courses in communication, science, mathematics, and computer technology integrated with sequential technical courses. Instructional strategies are designed to emphasize the application of academic principles. A sample Tech Prep course sequence in Marketing includes the following

applied academic courses: applied communication, applied mathematics, and biotechnology (applied biology and chemistry). The technical core of courses includes the Introduction to Business Technology and Business Computer Applications I. Designed and updated by business and industry input, both courses prepare students in computer technology and offer three (3) college credits by substitution for the college level CGS 1000 (Introduction to Computers) course at SFCC. The required technical core also consists of Accounting I and Marketing and Distribution I and II. GEB 1011 (Introduction to Business) and MAN 2021 (Principles of Management) are college level dual enrollment courses offered in the senior year for college credit. All Tech Prep programs require four years of mathematics and offer a college level dual enrollment math course to eligible students in the senior year. In the Marketing course sequence, MAT 1033 (Intermediate Algebra) or MTB 11 03 (Business Math) are college level options. The articulation agreement offers twelve (12) college credits to Tech Prep program completers.

An example of successful college teaching in MAR 2011 (Principles of Marketing) at SFCC is a challenging project which integrates academic and technical course content. MAR 20 11 students selected the collaborative Tech Prep program as their class marketing project for the semester. Designing an interdisciplinary unit, the SFCC Marketing instructor formed cooperative learning groups of students to teach them teambuilding skills in planning and conducting a community-wide marketing campaign promoting Tech Prep. Students in the marketing course integrated their activities in their academic courses. In ENC 2210 (Technical Communication), students produced text for newsletters and designed, distributed, and tabulated a marketing survey of prospective Tech Prep students' preferences in television and radio. Working with the college instructor of RTV 1300 (Video Production), marketing students produced a script and video for cable television. Through the curriculum of the MMC 11 20 (Multi-media Writing), MMC 2 1 00 (Journalism for Mass Media) and graphic design courses, the marketing students learned to produce graphics and text for newspaper articles, brochures, and public information advertisements. Local newspapers and radio and television stations provided work-site experiences for students in publicizing various aspects of the Tech Prep program for both student and parental audiences. Though this creative and productive project, which benefited many students and parents in a highly successful community awareness effort, the marketing students realized the relevance of both their academic and technical studies.

The marketing students also helped coordinate a campus-wide career fair promoting technical occupations.

Tech Prep Marketing students who are interested in continuing their education beyond a two-year associate degree have the option to obtain a four-year degree in Business Administration and Management. Twenty-four college credits from the associate degree program are granted toward the junior and senior year of the bachelor's of science degree by St. Leo's College.

The Tech Prep Automotive Service Technology program is another example of collaborative planning between high school and community college instructors and of successful college teaching strategies. A selected number of secondary automotive mechanics courses have been developed which may be substituted for three college level automotive technology courses. Students have benefited from the collaborative efforts of the automotive technology instructor who coordinates his teaching of the use of oscilloscopes with the applied physics instructor's labs illustrating physics principles relevant to automotive technology. The college level applied mathematics course (MTB 1310), which is offered for dual enrollment credit to seniors, was designed to integrate mathematical principles into the automotive curriculum. The work-site learning experiences for students who learn specific skills in their college technical classes and then practice their skill in an actual automotive service job has been a very effective teaching strategy. As technology rapidly changes, the college automotive instructor works closely with the industry representatives to update the curriculum. Both graduates and employers seem very satisfied with the employment readiness provided resulting from this integration of workbased learning and relevant college instruction.

Secretary's Commission for Achieving Necessary Skills

An extensive research project by the United States Department of Labor was completed in 1991. The Secretary's Commission on Achieving Necessary skills (SCANS) conducted a twelve month study of business owners, employees, human resource managers, and union officials to determine the level of skills required to enter employment. The document entitled What Work Requires of Schools: A SCANS Report for America 2000 defined the skills needed, proposed acceptable levels of proficiency for the skills, and suggested effective ways to assess

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proficiency. William E. Brock, SCANS chairperson, reported that after lengthy interviews with employers in a wide range of jobs, "the message was universal: good jobs will increasingly depend on people who can put knowledge to work. What we found was disturbing: more than half our young people leave school without the knowledge or foundation required to find or hold a good job."

Contributing factors to this dilemma which has dramatically changed the conditions for young people's entry into the world of work include the globalization of commerce and industry and the explosive growth of technology in the workplace. The SCANS research summarized in Appendix IV verifies effective job performance in terms of five competencies and a three-part foundation of skills and personal qualities that are essential to successful employment. The study also concluded that these eight essentials should be taught in an integrated fashion that reflects the workplace contexts in which they are applied. The implications for successful college teaching are obvious: learning skills "in context" will be most effective by placing learning objectives within a real environment rather than insisting that students first learn in the abstract what they will be expected to apply. The need for ongoing partnerships among academic and technical instructors and business partners is readily apparent, also. To assist instructors in implementing the teaching of SCANS competencies, a partnership among secondary and postsecondary educators and business representatives with the leadership of Dr. John Hansen, Florida State University, developed inservice modules. The SFCC Tech Prep Consortium Coordinator served on the SCANS project advisory team in the design process and worked with college instructors and students in modeling desired teacher competencies. The focus of this SCANS staff development project was to assist instructors in modifying their instructional strategies to address multiple intelligences, cultural diversity, and team building through cooperative learning. In a Tech Prep Summer Institute, the SFCC Tech Prep Coordinator, college instructors, recent SFCC graduates, and business representatives worked with students in cooperative learning groups to increase all participants' understanding of the need for improving interpersonal skills to succeed in the workplace. The partnership among SFCC, the School Board of Alachua County, the Girls Club, and numerous corporate sponsors provided an opportunity for students to participate in career exploration activities in eight technical occupations and in work-sites visits to discuss how employees use communication and interpersonal skills and other academic concepts in their jobs.

Partnerships for Integrating Academic and Technical Education

TriCounty Technical College in Pendleton, South Carolina, in partnership with their Tech Prep consortium, PACE (Partnership for Academic and Career Education), has sponsored exemplary planning and staff development activities in integrating the SCANS competencies in the faculties of both academic and technical disciplines. Appppendix V outlines the components of the college Tech Prep partnerships and of the competency areas addressed in the college applied courses.

As a partner in the Seattle Tech Prep consortium, South Seattle Community College has developed over twenty college level applied curriculum courses. Apppendix VI describes the courses as well as the components of their successful college teaching in the college applied courses.

To implement the continuously changing course content and innovative instructional strategies, educators need extensive staff development and common planning time with colleagues in other academic and technical disciplines and with business representatives. Opportunities for instructors and their students to visit and to study work sites are imperative in successful Tech Prep college teaching. The examples of effective integration and updating of curricula and instructional techniques were accomplished through partnerships among secondary and postsecondary educators, academic and technical faculty members, and responsive business and civic representatives. Successful college teaching is enhanced by collaborative efforts designed to prepare students for global competition and cooperation, further education, and for a career in an increasingly complex technological society.

APPENDIX VI
SCANS

FIVE COMPETENCIES

Resources: Identifies, organizes, plans, and allocates resources

- A. Time--Selects goal-relevant activities, ranks them, allocates time, and prepares and follows schedules
- B. Money--Uses or prepares budgets, makes forecasts, keeps records, and makes adjustments to meet objectives
- C. Material and Facilities--Acquires, stores, allocates, and uses materials or space efficiently
- D. Human Resources--Assesses skills and distributes work accordingly, evaluates performance and provides feedback

Interpersonal: Works with others

- A. Participates as Member of a Team--contributes to group effort
- B. Teaches Others New Skills
- C. Serves Clients/Customers--works to satisfy customer's expectations
- D. Exercises Leadership--communicates ideas to justify position, persuades and convinces others, responsibly challenges existing procedures and policies
- E. Negotiates--works toward agreements involving exchange of resources, resolves divergent interests
- F. Works with Diversity--works well with men and women from diverse backgrounds

Information: Acquires and uses information

- A. Acquires and Evaluates Information
- B. Organizes and Maintains Information
- C. Interprets and Communicates Information
- D. Uses Computers to Process Information

Systems: Understands complex inter-relationships

- A. Understands Systems--knows how social, organizational, and technological systems work and operates effectively with them
- B. Monitors and Corrects Performance--distinguishes trends, predicts impacts on system operations, diagnoses deviations in systems' performance and corrects malfunctions
- C. Improves or Designs Systems--suggests modifications to existing systems and develops new or alternative systems to improve performance

Technology: Works with a variety of technologies

- A. Selects Technology--chooses procedures, tools or equipment including computers and related technologies
- B. Applies Technology to Task--Understands overall intent and proper procedures for setup and operation of equipment
- C. Maintains and Troubleshoots Equipment--Prevents, identifies, or solves problems with equipment, including computers and other technologies

SCANS

A THREE-PART FOUNDATION

Basic Skills: Reads, writes, performs arithmetic and mathematical operations, listens and speaks

A. Reading-locates, understands, and interprets written information in prose and in documents such as manuals, graphs, and schedules
B. Writing--communicates thoughts, ideas, information, and messages in writing; and creates documents such as letters, directions, manuals, reports, graphs, and flow charts
C. Arithmetic/Mathematics--performs basic computations and approaches practical problems by choosing appropriately from a variety of mathematical techniques
D. Listening--receives, attends to, interprets, and responds to verbal messages and other cues
E. Speaking--organizes ideas and communicates orally

Thinking Skills: Thinks creatively makes decisions, solves problems, visualizes, knows how to learn, and reasons.

A. Creative Thinking--generates new ideas
B. Decision Making--specifies goals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternative
C. Problem Solving--recognizes problems and devises and implements plan of action
D. Seeing Things in the Mind's Eye--organizes, and processes symbols, pictures, graphs, objects, and other information
E. Knowing How to Learn--uses efficient learning techniques to acquire and apply new knowledge and skills
F. Reasoning--discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem

Personal Qualities: Displays responsibility, self-esteem, sociability, self-management, and integrity and honesty

A. Responsibility--exerts a high level of effort and perseveres towards goal attainment
B. Self-Esteem--believes in own self-worth and maintains a positive view of self
C. Sociability--demonstrates understanding, friendliness, adaptability, empathy, and politeness in group settings
D. Self-Management--assesses self accurately, sets personal goals, monitors progress, and exhibits self-control
E. Integrity/Honesty--chooses ethical courses of action

Competency Areas

1. Oral/Written Communication
2. Technical/Professional/Ethical
3. Information/Date Processing
4. Mathematical/Computational
5. Critical Thinking/Problem Solving
6. International/Intercultural
7. Interpersonal/Teamwork

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